ZooKeys 514: 15–23 (2015)
doi: 10.3897/zookeys.514.9545
http://zookeys.pensoft.net

RESEARCH ARTICLE

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A new species of *Zachaeus* C.L. Koch from Turkey (Opiliones, Phalangiidae)

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Academic editor: *A. Kury* | Received 6 March 2015 | Accepted 29 June 2015 | Published 22 July 2015

http://zoobank.org/E273CF0D-A882-49B3-8AA9-D85A489B753E

Citation: Kurt K, Koç H, Yağmur EA (2015) A new species of *Zachaeus* C.L. Koch from Turkey (Opiliones, Phalangiidae). ZooKeys 514: 15–23. doi: 10.3897/zookeys.514.9545

Abstract

A new species of harvestmen, *Zachaeus seyyari* **sp. n.** (Opiliones, Phalangiidae), is described and illustrated on the basis of both sexes from Şırnak Province in Turkey. Differences between the new species and related species are indicated. Photographs of its characteristic structures are also provided.

Keywords

Opiliones, Phalangiidae, *Zachaeus*, new species, Turkey

Introduction

Zachaeus C.L. Koch, 1839 is a genus belonging to the subfamily Phalangiinae of the Phalangiidae and it is distributed in the eastern part of the Mediterranean Region, south-eastern Europe, and western Asia (Snegovaya and Staręga 2008). The genus includes 12 species: *Z. anatolicus* (Kulczynski, 1903), *Z. birulai* (Redikorzev, 1936), *Z. crista* (Brullé, 1832), *Z. hebraicus* (Simon, 1884), *Z. hyrcanus* (Redikorzev, 1936), *Z. kervillei* (Sørensen, 1912) species inquirenda, *Z. lupatus* (Eichwald, 1830), *Z. mirabilis* (Caporiacco, 1949), *Z. orchimonti* (Giltay, 1933), *Z. redikorzevi* (Staręga & Chevrizov, 1978), *Z. shachdag* (Snegovaya & Staręga, 2008), and *Z. simferopolensis* (Chemeris &

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Kovblyuk, 2005) [Giltay 1933; Redikorzev 1936; Caporiacco 1949; Snegovaya and Staręga 2008], of which five are known in Turkey: *Z. anatolicus*, *Z. crista*, *Z. hebraicus*, *Z. orchimonti*, and *Z. redikorzevi* (Kurt, 2014).

The genus is characterized by the following morphological characteristics: body large, heavily denticulated dorsally; chelicerae usually strong, second segment enlarged; pedipalps normally structured, strong, robust; legs short and first pair much thicker than the others; truncus penis basally widened, parallel-sided on the distal half, distally shallow spoon-shaped, glans usually banana-shaped (shorter in *Z. anatolicus* and *Z. seyyari*), stylus long (Snegovaya and Staręga 2008, 2009). Here, we describe a new species of the genus *Zachaeus* from Şırnak Province in Turkey, and compare it to the most similar species.

Material and methods

Samples were collected by hand from the meadows and grassland in Şırnak Province, Turkey. Species identification was conducted using a Leica EZ4 stereomicroscope. Specimens are preserved in 70% ethanol and deposited in the collection of the Arachnological Laboratory of Şiran Vocational School, Gümüşhane University (GUSAL), Turkey. All measurements are given in millimeters.

Results

Taxonomy

Family Phalangiidae Latreille, 1802
Genus *Zachaeus* C.L. Koch, 1839

***Zachaeus seyyari* sp. n.**
http://zoobank.org/89BE1BA3-8AEE-4CB1-A1F2-17B789F8BB6C
Figs 1–4

Type material. Holotype: 1♂ (GUSAL), Turkey: Şırnak Province, İdil District, Yörük Village (37°16'47.54"N, 42°1'17.18"E), 655 m, 12 May 2007, leg. E.A. Yağmur and H. Koç.

Paratypes. 2 ♂, 4♀ (GUSAL), 1 ♂, 1♀ (AZMM=Alaşehir Zoological Museum, Manisa) same data as holotype.

Distribution. Up to now only known from type locality in the Şırnak Province, Turkey.

Diagnosis. The new species is similar to *Z. anatolicus* (Kulczyński 1903: 660; Šilhavý 1956: 34, figs 1–5; -1965: 382–384, figs 1–13, Staręga 1976: 376, figs 75–77; Chevrizov 1979: 22, figs 119–121) and *Z. redikorzevi* (Staręga and Chevrizov 1978: 419–422, figs 1–2; Staręga 1978: 219; Chevrizov 1979: 22, figs 122–124; Kurt et al. 2011: 146–147, figs 1–8). The differences between these species are given in Table 1.

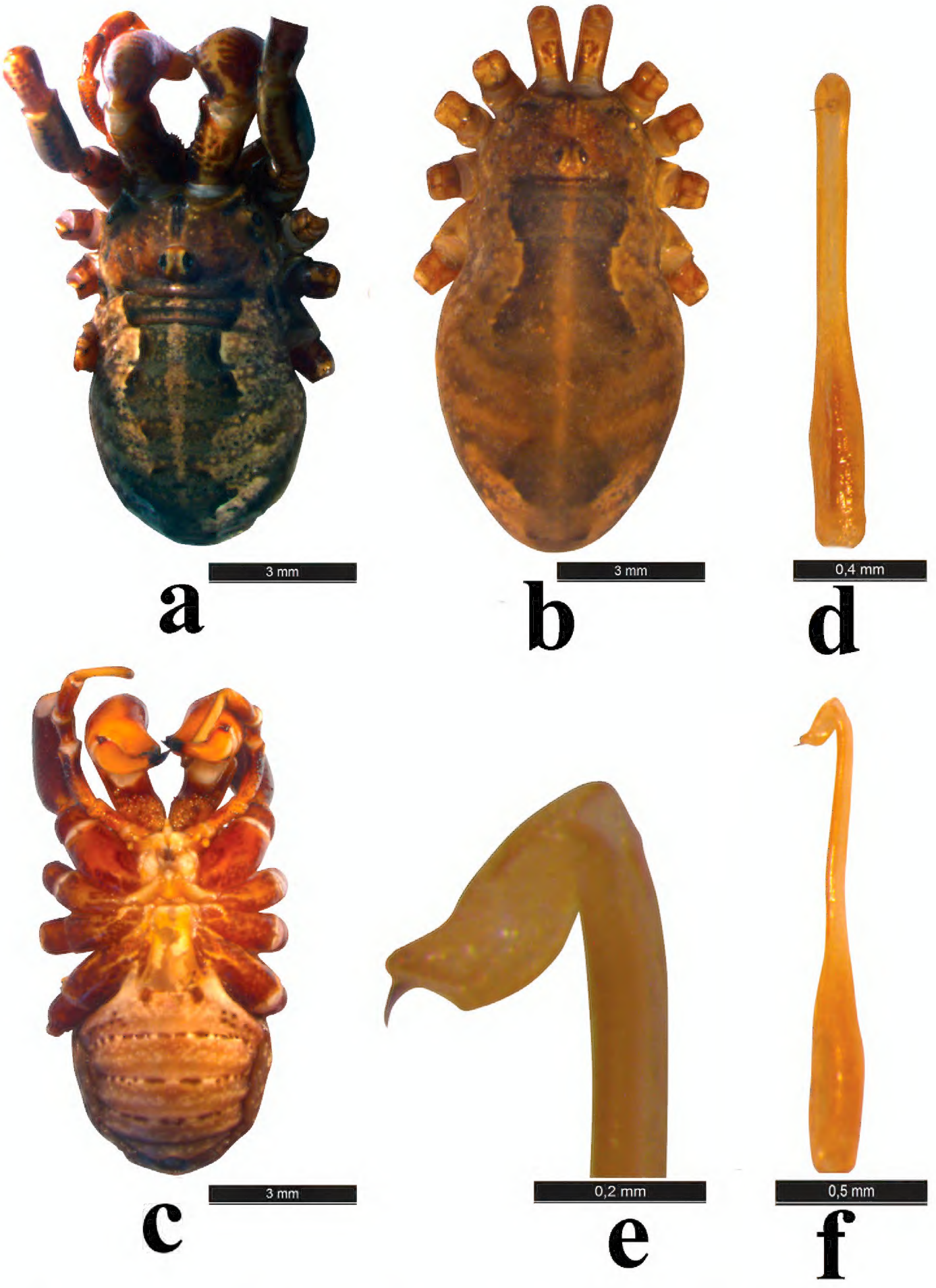

Figure 1. *Z. seyyari* sp. n.: **a** body, male, dorsal view **b** body, female, dorsal view **c** body, male, ventral view **d** penis, dorsal view **e** glans, lateral view **f** penis, lateral view.

Derivatio nominis. The specific epithet is in honor of Dr. Osman SEYYAR (Niğde University, Niğde, Turkey), who has made important contributions to Turkish arachnology.

Table 1. Main diagnostic characters of most closely related species in the genus *Zachaeus*.

Characters	*Z. seyyari* sp. n.	*Z. anatolicus*	*Z. redikorzevi*
Body	cephalothorax dorsally with small denticles; abdomen dorsally not denticulated	cephalothorax and abdomen dorsally with numerous denticles (Staręga 1976).	cephalothorax dorsally only granulated on surface, abdomen dorsally not denticulated (Staręga and Chevrizov 1978)
Tuber oculorum	relatively low and 1–2 setae in two rows	low and 4–8 tubercles in two rows (Staręga 1976).	low and 5–6 tubercles in two rows (Staręga and Chevrizov 1978)
Chelicerae of male	second segment swollen (more cylindrical), covered with setae.	second segment not swollen, covered with setae and microdenticles (Staręga 1976).	second segment extraordinarily swollen, covered with setae and microdenticles (Staręga and Chevrizov 1978)
Palp of male	patella dorsally with setae; tibia with setae.	patella dorsally with microdenticles, tibia with setae and microdenticles (Staręga 1976).	patella dorsally with setae; tibia only with setae (Staręga and Chevrizov 1978)
Leg	femur I–III with setae; femur IV ventrally with denticles, dorsally setae.	femur I–IV with denticles (Staręga 1976).	femur I–III with setae; femur IV ventrally with denticles (Staręga and Chevrizov 1978)
Penis	truncus wide at the base, basal to center with straight sides; then slightly narrowed at the center; then not widened, straight-sided at the subapex; glans stocky, not elongated, parallel sided, ventrally slightly oval-sided, apical outline rectangular.	truncus wide at the base, base to center narrowed; then widened at the subapex; glans, stocky, not elongated, ventrally oval (Staręga 1976).	truncus slightly enlarged at the proximal half; then straight-sided in distal half; glans elongated and narrow, ventrally oval-sided, apical outline triangular (Staręga and Chevrizov 1978)

Table 2. Measurements (in mm) of male holotype (female paratype).

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Palp	1.7 (1.5)	0.9 (0.85)	1.2 (0.95)	- (-)	1.9 (1.7)	5.7 (5.0)
Leg I	3.2 (2.8)	1.4 (1.2)	2.94 (2.2)	2.7 (2.1)	4.2 (4.0)	14.44 (12.3)
Leg II	3.8 (3.4)	1.5 (1.4)	3.5 (3.1)	3.7 (3.1)	7.9 (7.8)	20.4 (18.8)
Leg III	2.3 (2.1)	1.3 (1.1)	2.5 (2.1)	3.0 (2.9)	4.8 (4.7)	13.9 (12.9)
Leg IV	3.5 (3.5)	1.4 (1.3)	3.3 (3.2)	3.5 (3.5)	7.2 (7.0)	18.9 (18.5)

Description. Male: body length 7.2 mm, width 4.5 mm; chelicera basal segment 2.8 mm, second segment 3.7 mm.

Body (Fig. 1a): approximately oval-shaped in dorsal view. Opening of odoriferous gland prominent with 1–2 black denticles. Cephalothorax covered with small black denticles. Carapace ochre-brown. Abdomen dorsally with distinct brownish-gray saddle. Saddle with longitudinal whitish-yellow stripe in the center. Abdominal tergites with transverse rows of dark brown spots, not denticulated.

Tuber oculorum (Fig. 4f): nearly hemispherical, median furrow present, relatively low and with 1–2 setae on each side.

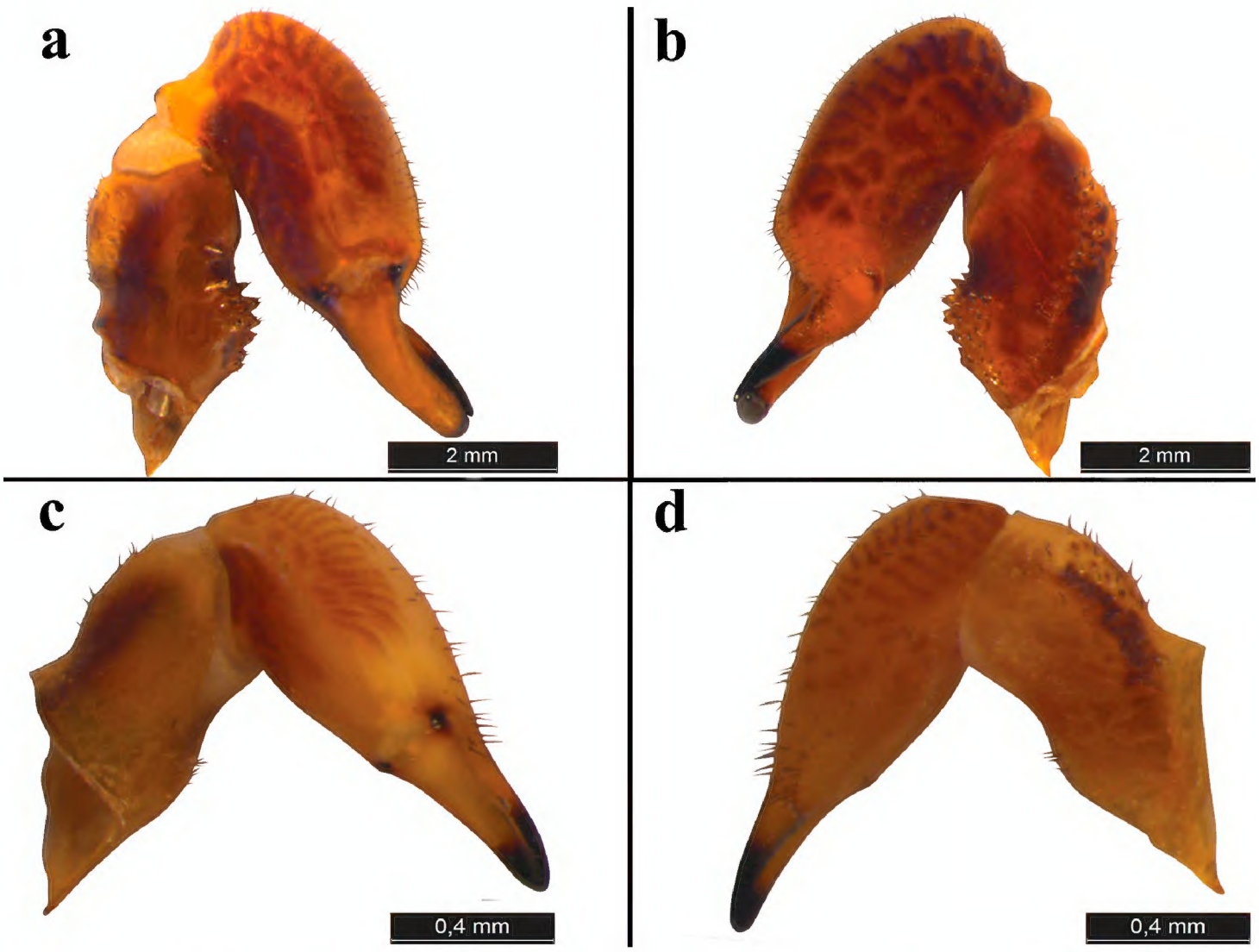

Figure 2. Chelicerae of *Z. seyyari* sp. n.: **a, b** chelicerae, male, lateral view **c, d** chelicera, female, lateral view.

Ventral side (Fig. 1c): coxae and genital operculum covered with sparse hairs. Abdomen ventrally with transverse rows of brown spots, and with sparse hairs.

Chelicerae (Fig. 2, 4e): strong, robust and dark ochre brown. Basal segment apically not widened and slightly bent, dorsally with small black-tipped tubercles and setae, ventrally with long black-tipped tubercles. Second segment apically widened, zebra-like stripe pattern of pigmentation, and covered with setae.

Pedipalp (Fig. 3): normally structured, strong; ochre-brown and with dark brown spots. Coxae with finger-shaped apophysis and covered with long setae; trochanter relatively long, ventrally and dorsally with black tubercles and setae; femur of male slighty curved, dorsally and ventrally covered with black-tipped tubercles and setae; patella distally with usual bulge densely hairy in female, less developed in male: similar in tibia; tibia and tarsus only with setae, but male tarsus ventrally bearing black microdenticles, tarsal claw smooth.

Legs (Fig. 4a–d): short and strong, light ochre-brown and with dark brown spots. Femur to tarsus I relatively thicker than in legs II to IV. Femur and patella I with setae, tibia ventrally with microdenticles and dorsally with setae, metatarsus ventrally covered with densely spaced microdenticles, tarsus bearing only setae. Leg pairs II and III with sparse setae. Femur and tibia IV ventrally covered with black denticles, and dorsally setae; metatarsus IV ventrally with bristle, dorsally with microdenticles; tarsus ventrally bristle, dorsally with setae.

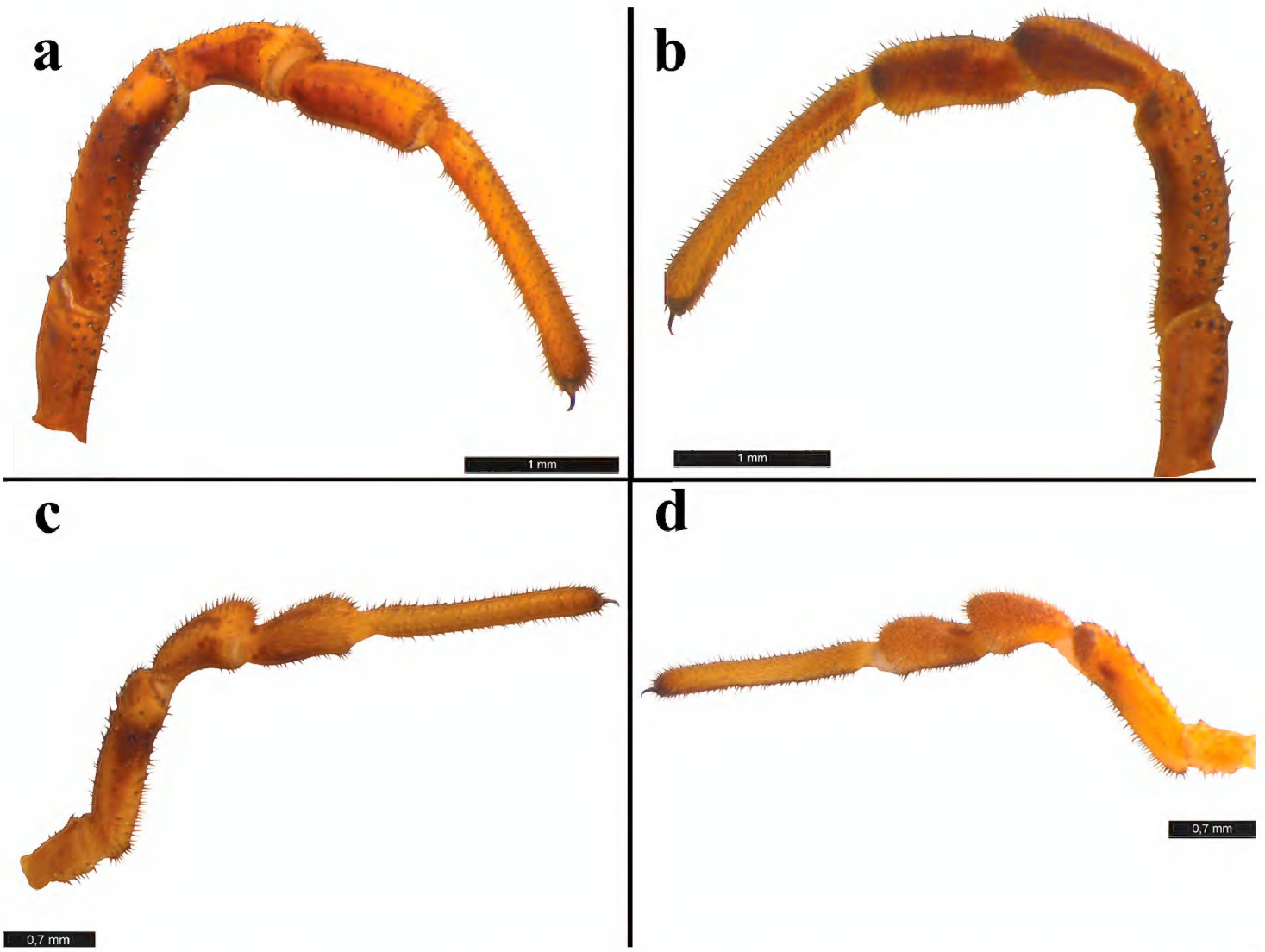

Figure 3. Pedipalp of *Z. seyyari* sp. n.: **a, b** pedipalp, male, lateral view **c, d** pedipalp, female, lateral view.

Male genital morphology (Fig. 1d–f): truncus wide at base, proximal fourth of shaft straight-sided ; then slightly narrowed at the center; straight-sided from center to distal end of shaft, forming a spoon-shape, wings not very wide; glans stocky, widened, not elongated, not banana-shaped; stylus long.

Female: body length 9.0 mm, width 4.7 mm; chelicera basal segment 1.5 mm, second segment 2.1 mm. General appearance similar to that of male, but body larger and wider (Fig. 1b). Second segment of chelicerae normally structured, not enlarged, basal segment ventrally without tubercles.

Discussion. This paper describes a new species belonging to the genus *Zachaeus*. This genus has five species (*Z. anatolicus*, *Z. crista*, *Z. hebraicus*, *Z. orchimonti*, and *Z. redikorzevi*) in Turkey. *Z. anatolicus* is distributed in Bulgaria, Caucasus, Crimea, Greece, former Yugoslavia, and Turkey (Adana, Ankara, Bayburt, Gümüşhane, Kayseri and Manisa Provinces) and *Z. redikorzevi* is recorded from Russia and Turkey (Bayburt, Gümüşhane, and Osmaniye Provinces) (Kurt 2014). *Z. crista* is distributed throughout South and Eastern Europe, Caucasus. It is widespread in Turkey (Ankara, Antalya, Bayburt, Bilecik, Bolu, Denizli, Gümüşhane, İzmir, Kırıkkale, Niğde and Osmaniye Provinces). *Z. hebraicus* is known from Jordan, Israel, Lebanon, Libya, Syria and Turkey (Adana, Manisa Provinces). *Z. orchimonti* is only known from Turkey (Aydın, Denizli, İzmir and Manisa Provinces) (Giltay, 1932) and *Z. kervillei* is known

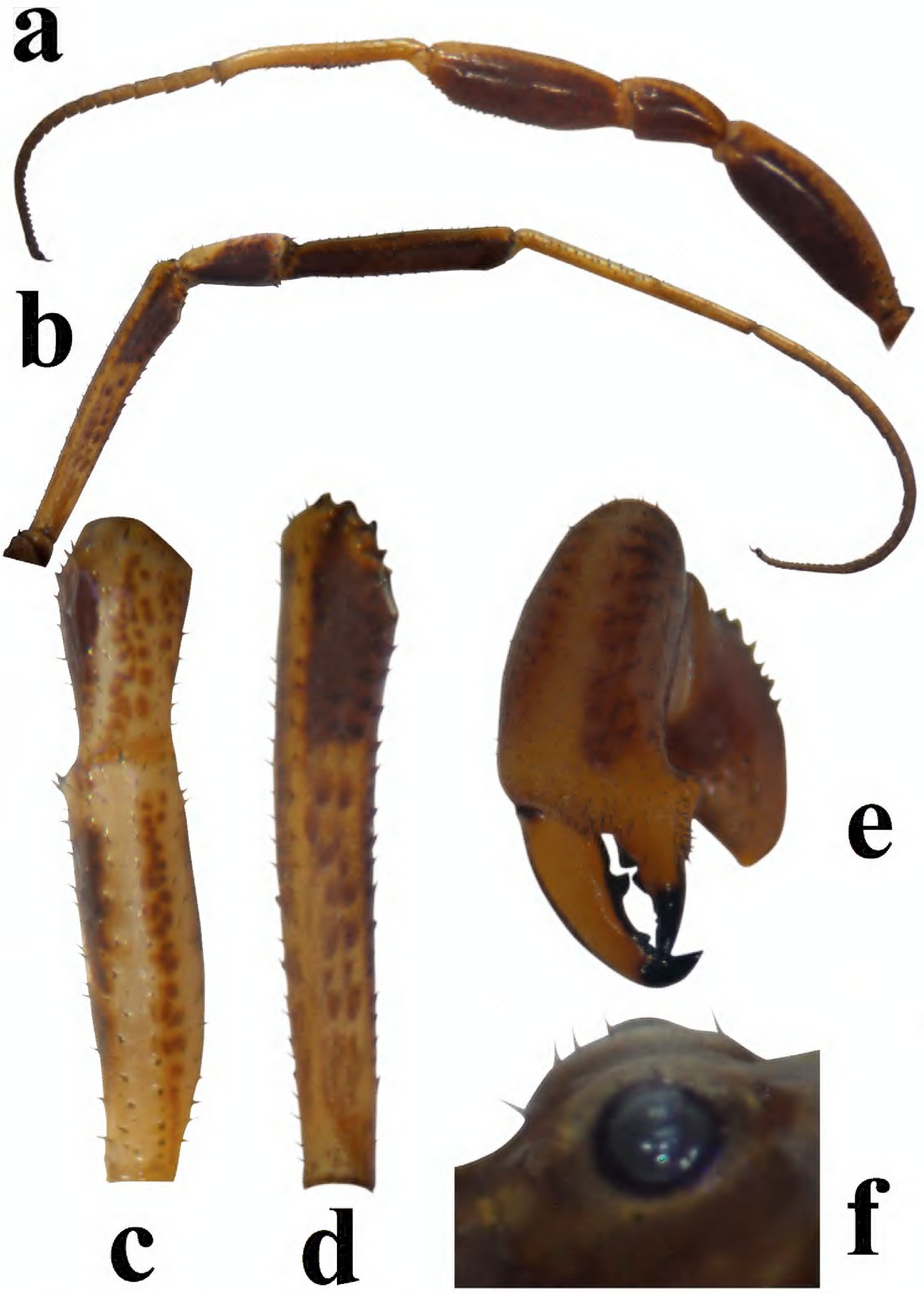

Figure 4. a, b Leg of *Z. seyyari* sp. n.: **a** pair I, male, lateral view **b** pair IV, male, lateral view **c** pair I femur and patella, female, dorsal view **d** pair IV femur, lateral view **e** chelicerae, male, frontal view **f** tuber oculorum, male, lateral view.

from Syria (Roewer 1923). The new species differs from *Z. hebraicus*, *Z. crista*, and *Z. kervillei* by the presence of setae only on the ocularium, abdomen not denticulated dorsally, and legs I–III femora covered with setae only (*Z. hebraicus*, *Z. crista*, and *Z. kervillei* are characterized by ocularium with denticles, abdomen dorsally denticulated, and leg I–III femora covered with denticles). *Zachaeus seyyari* sp. nov. differs from *Z. orchimonti* by a setose ocularium, femur of pedipalp dorsally and ventrally covered with black-tipped tubercles and setae (in *Z. orchimonti*, ocularium with 5–7 small denticles and femur of pedipalp with setae).

With *Zachaeus seyyari* sp. n., the number of *Zachaeus* species known from Turkey is now increased to 6. Considering the geographical features of Turkeyand the habitat preferences of the genus, the number of species will surely increase with ongoing studies in the future.

Acknowledgments

We are grateful to Dr. A. Kury (Museu Nacional, Universidade Federal do Rio de Janeiro Rio de Janeiro, Brazil) and Dr. N. Snegovaya (Institute of Zoology, NAS of Azerbaijan) for advice and helpful comments.

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